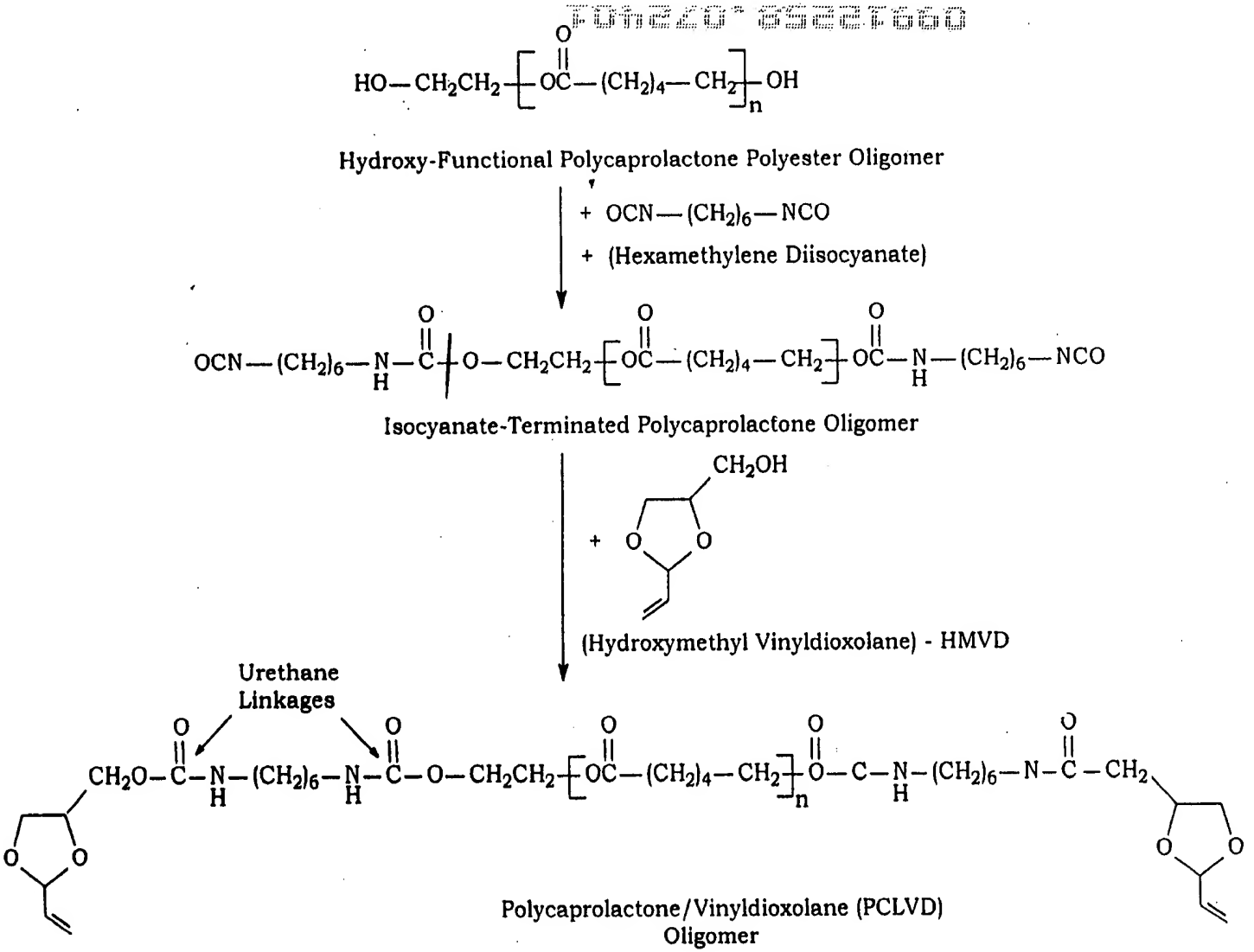

HO—CH2CH2—[—OC—(CH2)4—CH2—]n—OH
Hydroxy-Functional Polycaprolactone Polyester Oligomer
+ OCN—(CH2)6—NCO
+ (Hexamethylene Diisocyanate)
OCN—(CH2)6—NH—C—O—CH2CH2—[—OC—(CH2)4—CH2—]—OC—NH—(CH2)6—NCO
Isocyanate-Terminated Polycaprolactone Oligomer
CH2OH
+
(Hydroxymethyl Vinyldioxolane) - HMVD
Urethane Linkages
CH2O—C—NH—(CH2)6—NH—C—O—CH2CH2—[—OC—(CH2)4—CH2—]n—O—C—NH—(CH2)6—N—C—CH2
Polycaprolactone/Vinyldioxolane (PCLVD) Oligomer

FIG. 1

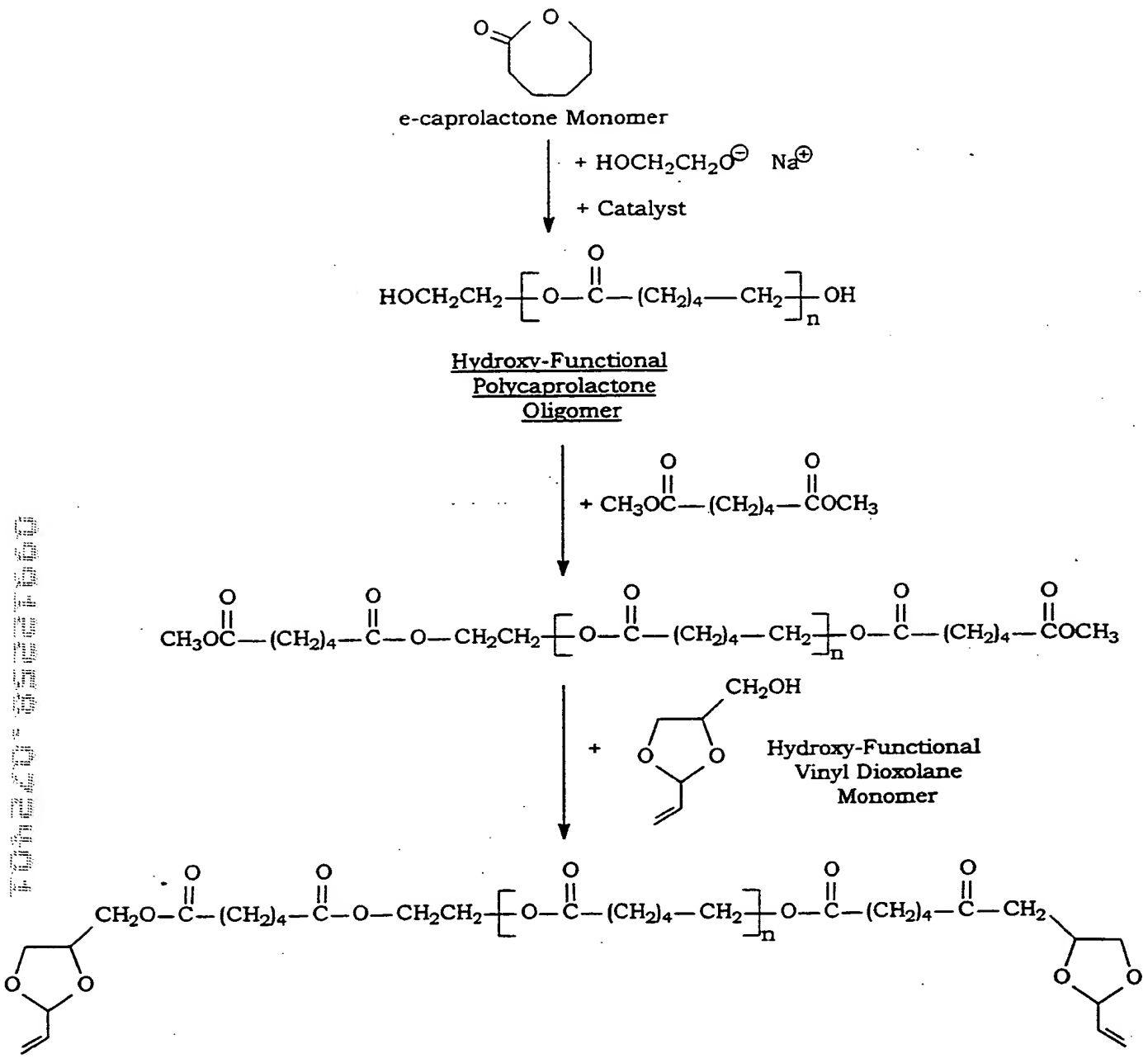
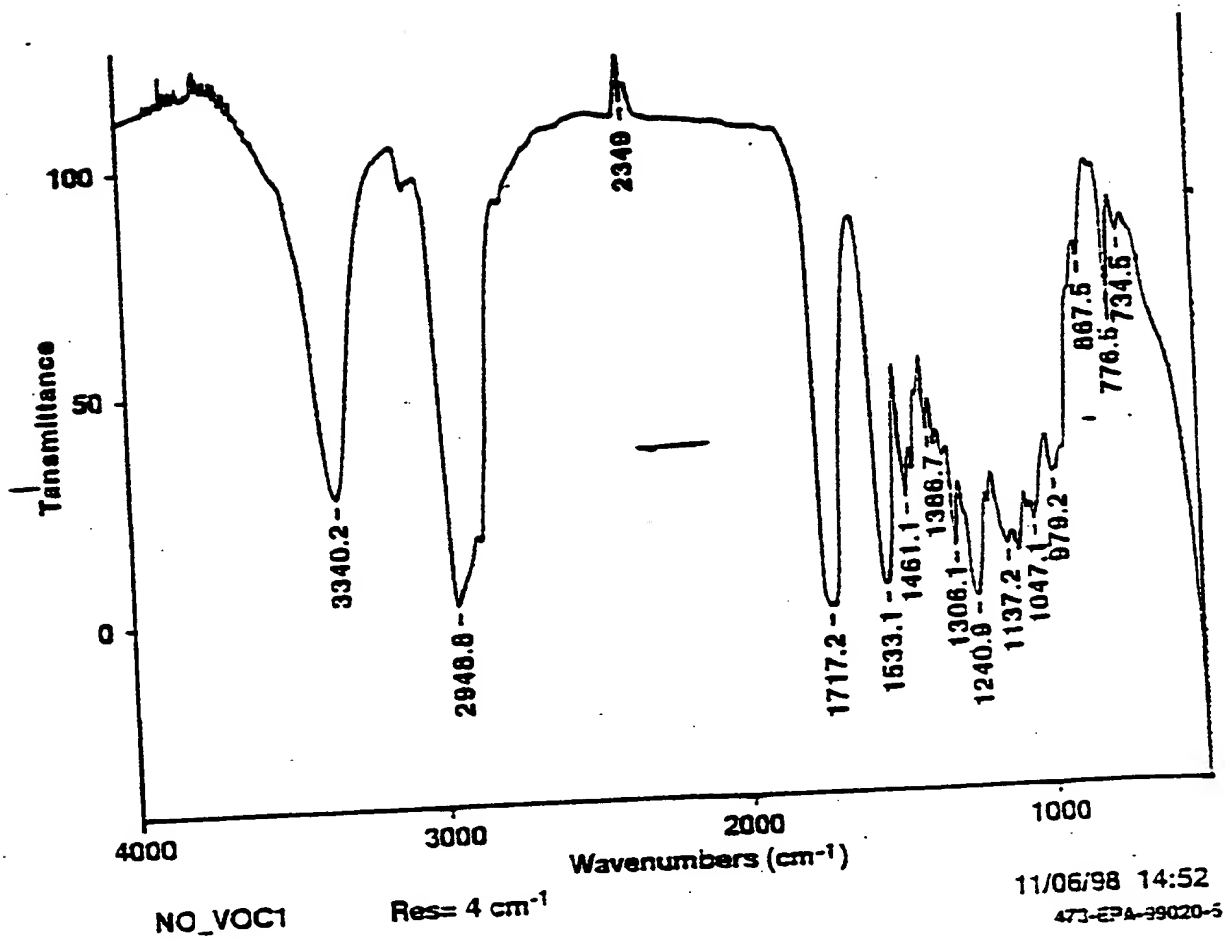

e-caprolactone Monomer
+ HOCH2CH2O⊖ Na⊕
+ Catalyst
HOCH2CH2—[O—C(=O)—(CH2)4—CH2]n—OH
Hydroxy-Functional
Polycaprolactone
Oligomer
+ CH3OC(=O)—(CH2)4—C(=O)OCH3
CH3OC(=O)—(CH2)4—C(=O)—O—CH2CH2—[O—C(=O)—(CH2)4—CH2]n—O—C(=O)—(CH2)4—C(=O)OCH3
+
CH2OH
Hydroxy-Functional
Vinyl Dioxolane
Monomer
CH2O—C(=O)—(CH2)4—C(=O)—O—CH2CH2—[O—C(=O)—(CH2)4—CH2]n—O—C(=O)—(CH2)4—C(=O)—CH2

FIG. 2



IR spectra of PCLVD synthesis

FIG. 3

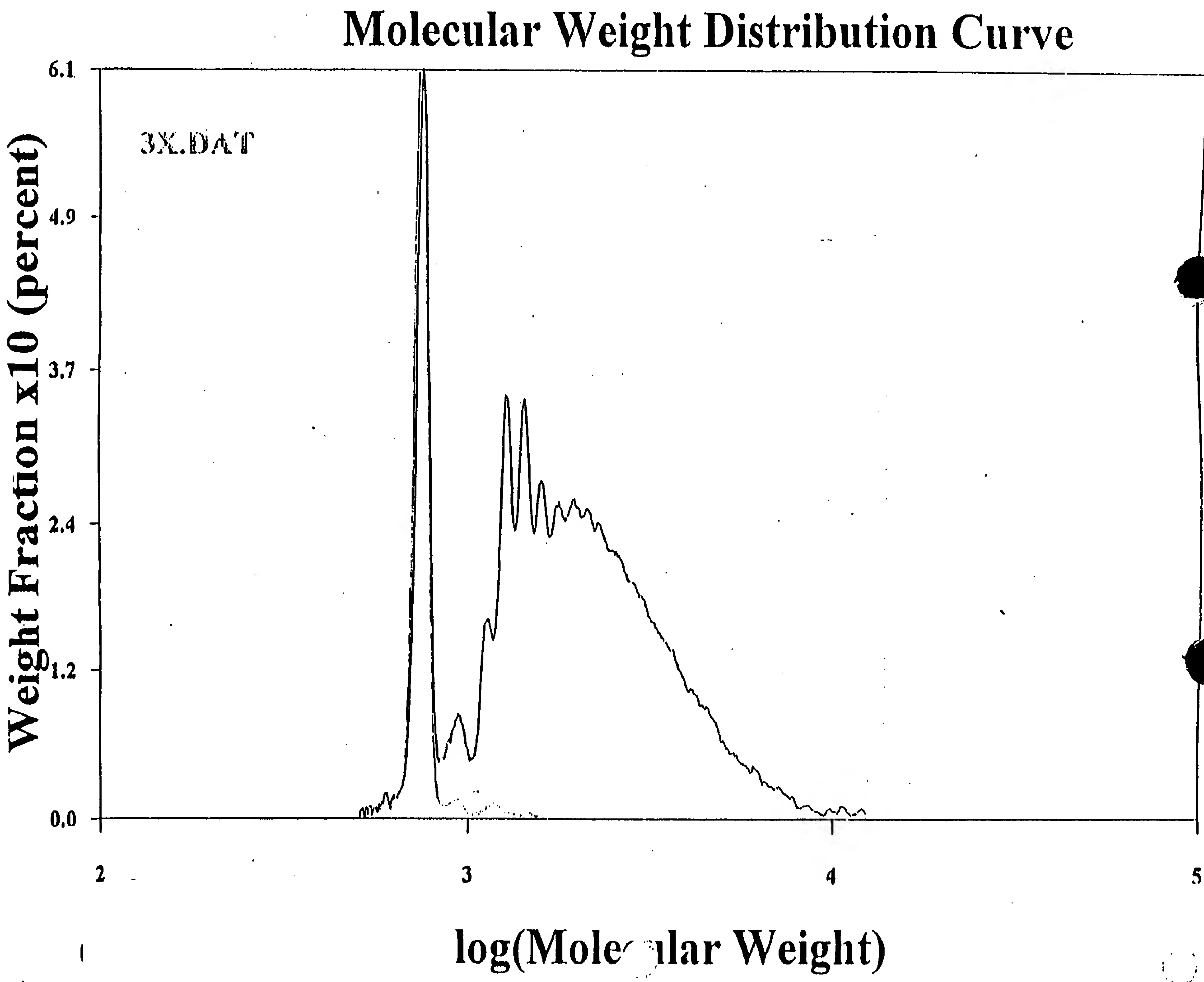

Molecular Weight Distribution Curve
3X.DAT
Weight Fraction x10 (percent)
6.1
4.9
3.7
2.4
1.2
0.0
2
3
4
5
log(Molecular Weight)

FIG. 4

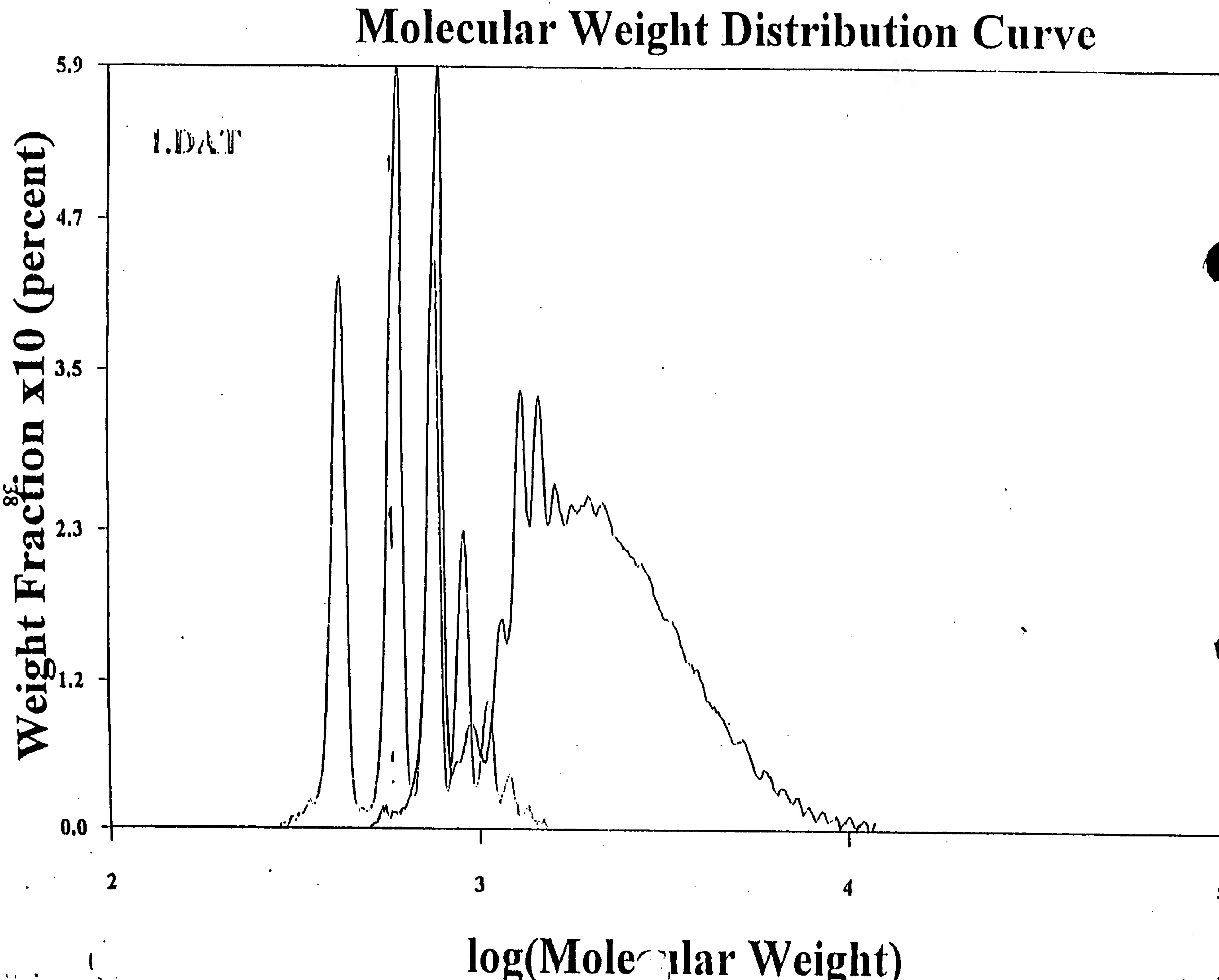

Molecular Weight Distribution Curve
1.DAT
Weight Fraction x10 (percent)
5.9
4.7
3.5
2.3
1.2
0.0
2
3
4
5
log(Molecular Weight)

FIG. 5